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ECONOMIC PROBLEMS OF COAL MINING
IN THE UNITED STATES
WITH
A SPECIAL TREATISE ON
UNIFORM ACCOUNTING PRACTICE FOR MINES

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PART I

WHY STUDY THE COAL SITUATION?

PUBLIC INTEREST

In a basic industry such as that of the coal industry in the United States, involving the prosperity of the nation and the happiness of each individual, it seems quite necessary that the people know definitely just how the situation stands. How the miners work and how their families live; how the operators manage their mines and what profits they make; how the coal is brought to market, what price is charged for it and how the price is determined; how the public interest is looked after or overlooked, as the case may be, are matters of intimate concern, not only to students of economics and those who have to burn coal but to every citizen of the country.

CONDITIONS IN THE COAL INDUSTRY

An intense study of the above facts will disclose that the public interest is not protected. It is grievously violated by conditions which might be remedied, by wastes which might be prevented, by practices which could be changed; to be specific, by a monopolistic combination in anthracite on the one hand, which keeps production low, prices high and increasing; and by an overdevelopment on the other hand in bituminous coal mining, which results in irregular operation, unequal earnings for operators, uncertain supply for consumers, forced idleness, and consequently inadequate incomes for miners.

In reviewing the labor relations in the past we

find that chronic ill-will and periods of bitter conflict are characteristic of the coal industry. After one of the most prolonged and disasterous of these conflicts, in 1922, Congress authorized the appointment of the United States Coal Commission. Unlike previous commissions, this one had no responsibility for settling a strike or fixing prices or other executive or judicial functions, but was charged with investigating the industry as a whole and presenting its findings to the President and Congress.

If the coal industry is subject to a lingering chronic malady from which it cannot recover by self internal adjustment; if it suffers from alternate chills and fevers with the changing seasons, then something must be done to try and bring into effect some harmonious adjustment of matters. The Coal Commission did not, as has been claimed, give a clean bill of health to the coal industry. It did make a diagnosis, and it found grave disorders, grave but not incurable. It called into consultations the most competent specialists.

WHAT CAN BE DONE

A solution of the situation might come through a decisive victory by some one of the interests in economic conflict with the others, as for example a complete domination by the miners' union, or by the financiers behind the operators, or by the competitors of coal. This is indeed the most familiar outcome of economic conflict, as it is of civil and international

warfare. Or a solution might take the form of compromise, each voluntarily yielding something for the sake of peace.

In a nation really capable of self-government in its economic as well as in its political relations there will be, however, constant search for another adjustment than either compromise or conquest. What if it should be found possible for every legitimate interest to be profitable, labor better protected and better paid, standards of living of the workers' families constantly raised, and yet output constantly increased, costs of production lowered, quality improved and guaranteed, and prices to consumers reduced? This would be integration without restraint of trade; prosperity without monopoly; the reconciliation of investment, management, labor, and consumption through stabilization, elimination of waste, improvement of methods and of labor relations and of the habits of consumers.

NEED FOR A NATIONAL POLICY

At present we have no national policy except one of drift, punctuated with blind, angry, futile slashing at miners or dealers or operators or railroads in time of scarcity, famine prices, and panic. A national policy need not be one of national ownership or of price fixing by decrees of government, although those are at least intelligible policies. It need not be one of hostility to the union, of open shop in the sense of abolishing collective bargaining, although that too is a policy, and one which is firmly held and consistently acted upon by a large and powerful section of the industry, and which

commands considerable outside sympathy. To arrive at a sound national policy we must first look at the facts. The facts also are many and many-sided; but they are not all of equal importance. None need more than miners, mine managers, mining engineers, mine financiers, wholesale and retail dealers, carriers, and large consumers to look beyond their special, technical, and often profound knowledge of details, and to join in giving consideration to the simpler, larger aspects of national policy; to join in creating a policy which will have a promise of giving to the industry stability and prosperity, and to the public a dependable supply of coal at reasonable prices. Naturally members of each of these groups know vastly more about their special interests and obligations than any outside student of coal economics can hope ever to know, and for that reason can contribute what no others can to the fund of common knowledge. They can do this best if they have some general understanding of other aspects ~~[illegible]~~, with which heretofore they may have been no more familiar than the general public.

PART II

A PRELIMINARY OUTLINE TO PART III

CONFLICT IN THE ANTHRACITE INDUSTRY

In the anthracite industry, there are five groups contesting with one another, each trying hard to subdue the others. Up to-date the strongest has tried to keep things as they are and has constantly won, so that at this moment the anthracite burning population of the United States is paying high prices in order to get its little bit of heat. These groups comprise the following:

1. The operating companies, the railroads, and the wholesalers and retailers.
2. The miners
3. The management
4. The consumers of anthracite
5. The non-anthracite consuming public

FIRST GROUP - OPERATORS, ETC.,

What do they want? This group wants to keep things as they are. Government regulation or nationalization or city-owned distributing agencies or changes of any kind are never mentioned by them except with disapproval. They have won large profits by keeping things as they are. It is only natural they should want to go on in the same way, and maintain a large and expensive organization to defeat change.

SECOND GROUP - MINERS

This group wants better wages. Also through the national organization, the United Mine Workers of America have said twice that they want nationalization of the mines. They have lost in getting what they wanted.

They together with the public want a change. They want less profiteering, lower freight rates, lower mining charges, lower distributing charges in order that they may have a fairer share of the price the consumer pays and so win a better life than they have at present.

THIRD GROUP - MANAGEMENT

This group is composed of mine managers. Many of them are engineers. They are paid by the coal companies to make money for them. If it was by stopping production, they did that. If it was by wasting coal, there is reason to believe they did that. If it was by crushing the domestic sizes into steam sizes, they did that. They are under orders. Many of them are men who would be eager to run the mines they are in charge of for the one and only purpose of getting production, constantly and efficiently. However, under the present organization of the industry, they take their orders from their owners, who seem ~~thus far~~ to have had a policy of restrictive cooperation.

FOURTH GROUP - ANTHRACITE CONSUMING PUBLIC

This group wants cheaper coal and more of it. They want the operators to make a decent return and the miners to get good wages, but at the same time they are very sick of being at the mercy of an industry that does not seem to be functioning as well as it should. They are beginning to think that keeping things as they are in a policy of watchful freezing is about the worst thing that could happen.

FIFTH GROUP - NON-ANTHRACITE PUBLIC

This group has a double though indirect interest in anthracite. If it were converted into power at the mines instead of used in the furnaces as fuel, it would affect the whole soft coal industry. If anthracite were nationalized, the rest of the public would watch the experiment with interest to see if the same thing could and should be done with bituminous coal.

It will be obvious from this simple statement, that the desires of the differently interested parties do not entirely coincide. Bearing in mind these different groups with their wants, we can now turn our attention to the following detailed outline in order to acquaint ourselves with the order in which the material will be presented in PART III:

The first section contains a brief introduction to the coal situation, and the following are some of the topics discussed: the location of coal deposits, anthracite production, bituminous coal production, consumers, ownership of coal fields, operators' problems, anthracite combination, railroads', and distributing agencies.

The second section takes up the discussion of the problems of the anthracite coal industry with some of the following topics: the anthracite situation, location of anthracite coal fields, ownership of fields, price of anthracite and how determined, costs, depreciation, taxes, working hours, labor turnover, accidents, inspection of mines, prevention of accidents, wages, housing conditions,

sanitary conditions, standard of living, and profits.

The third section takes up the discussion of the problems of the bituminous coal industry and we find some of the following topics: pecularities of the bituminous coal industry, union and non-union territories, future markets, price, wastes and their causes, causes and results of over-development, costs of operation, organization, improvements and their needs, methods of settling disputes, influence of the union fields, strikes, employment, accidents, earnings of miners, housing conditions, sanitary conditions, and profits.

PART III

A BRIEF INTRODUCTION TO THE ECONOMIC PROBLEMS OF COAL MINING

QUANTITY OF COAL IN THE UNITED STATES

It is the high grades coals in the eastern
part of the country, of which we have the smallest supply,
that we are using up the fastest. At the present rate
our anthracite will not last more than a hundred years. ø (6)33-36
The semi-bituminous coal is going nearly as fast and at 352
an increasing rate of production. Its exhaustion will (6)355
be a more serious loss. (7)92

Our thirty-five hundred billion tons include all(6)31
grades, from the hardest graphitic anthracite to the poor-(A)1850
est brown woody lignite. The anthracite is nearly all
in a small area of less than five hundred square miles (6)16
in eastern Pennsylvania. Most of the semi-anthracite (16)5-6
and semi-bituminous coal also is in the Appalachian
region; the rest in Arkansas, Oklahoma, Colorado, and
Washington. The vast deposits of sub-bituminous coal
and lignite for the most part lie west of the Mississippi,
in Texas, New Mexico, Colorado, and the northern plains.
Only the deposits of bituminous coal are so scattered as
to be within easy reach of all parts of the country. (6)16-27
Only the lower grades have a long future in prospect.
Even of bituminous coal, the thick beds of the most desired kinds, which are near the surface and near large
markets, are being depleted rapidly. If coal were coal,
i.e., if all the thirty-five hundred billion tons in our

ø (Book) Page see Bibliography

subterranean coal bins were equally serviceable for all
purposes, we could say that we have enough to last for (6)33-36
many hundreds of years. If on the other hand we should
assume that the amount we use will go on increasing at
the same rate as in the years just before the World War,
we would be shocked to find that our vast stores could
hardly be expected to hold out for any great length of (6)362-366
time.

PRODUCTION OF ANTHRACITE COAL

The amount of anthracite mined from year to year, (16)69
even, before 1914, had been settling down to a level, not (A)847
even keeping up with the increase in population in its
accustomed markets. In the last ten years it has closely
maintained that general level, except for an increase in
the years 1917 and 1918. (6)357

PRODUCTION OF BITUMINOUS COAL

Production of bituminous coal has shown no tendency to seek a level, but its rate of increase has been
slowing down from the dizzy speed of the first years of
the twentieth century. Between 1900, about the time when
we passed Great Britain and became the chief coal pro- (1)5
ducing nation of the world, and the beginning of the War
our annual output of soft coal doubled, and by 1918, the (12)5
year of maximum production, it had almost trebled. Since (14)57
then there have been abnormal ups and downs, because of (A)185
suspensions in 1919 and 1922 and general business depression in 1921, with subsequent attempts at recovery in 1920
and 1923. Production is not keeping up with what appeared
before the war to be the normal rate of increase required

for our industrial development.

MARKETS

Nearly all the coal mined in the United States
finds its consumers within our own boundaries. A little
is sent to the central stretch of Canada. From an (A)683
academic point of view it would seem that America, rather
than England and Wales, could better afford to supply
the countries which have no coal of their own. But the (1)25 (6)355
high wage of both labor and capital in America, the
expense of the long hauls to shipping points, and the
high freight rates at sea, have prevented our coal thus
far from competing to any considerable extent in foreign (13)3
markets.

LABOR CONDITIONS

With their families, the coal mine workers make
up a population of three or four million. Their services (14)13 60
are indispensable to the daily life of every household of
the nation. However, there are too many miners, and
their numbers are increasing. The excess and the increase
are entirely in the bituminous coal mines. The labor (A)501
force of the anthracite mines has been about stationary in
recent years, though it could be increased to the advantage
of the anthracite-consuming public. There are already
enough bituminous coal miners, on the other hand, to
produce at least twenty-five per cent more coal than has
ever been used in any year. (6)270

ANTHRACITE MONOPOLY

The anthracite deposits are now owned by a small

number of corporations, estates, and individuals, many of whom acquired them long ago, at prices which look (A)677 rediculously small, in comparison with the income they yield to-day. Of the total recoverable tonnage of anthracite still left in the ground, nine-tenths is owned by the so-called "companies", i.e., the coal companies (6)257 (10)3 which were formerly owned by the railroads serving the anthracite region or by common owners and are still more or less indentified with them economically. The other tenth is owned by "independent" operating companies and by non-operating corporations, estates, and individuals.

OVERDEVELOPMENT OF THE BITUMINOUS COAL INDUSTRY

No statistics are available in regard to the owners of the bituminous coal deposits, but ownership of them, like the deposits themselves, is widely diffussed. (6)258 There are thousands of them, from the homesteader who (A)228 does not know he ownes any coal or the farmer who digs a few tons out of the side of his hill for his own use, up to the great mining enterprises which have acquired thousands of acres for the express purpose of exploiting the underground riches. Railroads and manufacturers buy mines and go into the mining business in order to be sure of having coal for their furnaces and locomotives.

CONTRAST BETWEEN THE ANTHRACITE AND BITUMINOUS OPERATORS

The typical anthracite operator is a big producer, a corporation and a manufacturer as well as an extractor. In the whole anthracite industry with its annual output of ninety million net tons, there are hardly more than a (1)5 (6)257 hundred operating concerns engaged in mining fresh coal and

washing culm piles, to which are added, in a year of high demand fifty or more engaged in dredging rivers for the fine coal washed down from the mines. Three-fourths of the hard coal is produced by ten companies. There is no typical bituminous coal operator, but only a heterogeneous, unorganized, infinitely diverse, and hotly competing aggregate. The industry, with its developed capacity of nearly a billion tons a year, (A)228 comprises over six thousand operating units and in a good year at least as many more "wagon mines" and "country banks" which are often, like the scattered wood lots, important local sources of fuel though they do not cut much figure in the statistics of production.

OPERATOR'S RISK.

Whether made at the mine or at some distant (14)145 center of finance, the forecasts and decisions are brought to the acid test of business success or failure. The operators must often take big risks. With their own or borrowed capital they acquire the mines, open them, lay them out, drive their shafts and entries, connect with railroads, build up a technical and administrative staff of engineers, managers, foremen, (A)202 207 211 221 and an occasional geologist; recruit miners and the great variety of mine workers needed inside and outside the mine, and in many cases build towns for them and their families to live in; arrange for the sale of the output, and devise plans for reserve coal lands

through lease or purchase. In short the operator must
organize his enterprise like any other, and when he
has created his organization he has only made a
beginning. He is constantly having to deal with
unforeseen emergencies. Deadly gas, dangerous coal
dust, surplus water, defective roofing, eccentric geologic
formations, many be in the mine to plague him. Labor
disputes, acute, intermittent, and chronic are at his (1)12
elbow. If he mines bituminous coal his days are nothing
but a series of emergencies. Fuel oil or natural gas
may destroy his uncertain markets. Prices play fantastic
tricks, controlled by forces far beyond his reach. The
supply of cars in which to transport his coal may fail (A)208
just when prices are highest and productive capacity
of his mine at its best. Cut-throat competition
is the condition which confronts, flanks, and drives
him. To conduct a successful business at all, requires
considerable skill, resource-fulness, patience, courage,
and money or credit. There is no organization of the
coal operators of the nation, corresponding to the
organization of the United Mine Workers of America. (16)193
Since production of anthracite and production of
bituminous coal are two distinct industries, only mildly
competing, the two groups of producers do not recognize
common interest, though the two groups of miners do. The
anthracite operators, without any formal organization for

general purposes, nevertheless have a sort of organic unity, the natural outgrowth of years of participation in a stabilized industry, which is concentrated both geographically and in the number of enterprises engaged. The Anthracite Coal Operators Association is not what its name suggests but an organization of "independent" (A)677 36 operators, i.e., others than the "railroad companies", created to deal with freight rates and other points in their relations with the carriers. (19)i

THE FINANCIER'S PART

Finance speaks the final word in many crises, whether speaking through some individual with original initiative, bold ideas, and unusual powers of persuasion, or through mere brutal control of railroads, docks, markets, and credit or through the sheer necessities of hard pressed operators who have exhausted their own resources and must beg for help on whatever conditions to avoid (A)39 bankruptcy. The financier has a responsibility easily distinguishable from that of other participants in the coal industry. It is his duty to support with the necessary funds such enterprises as are soundly conceived and efficiently conducted.

THE RAILROAD'S PART

To get the coal from twelve or fourteen thousand mines and distribute it to every important center of population in the country is a big transportation problem, perhaps the biggest in the world. The investment of the railroads chargeable to the requirements of coal

transportation is larger than that put into the mines by the coal owners and operators combined. The anthracite carriers have intimate relations with one another. (10)51
Bituminous carriers on the other hand, like the operators, engage in a free for all competition, opening new fields with long hauls, assigning cars for their own fuel when there is a shortage of cars, until the latter practice (6)200
was stopped by the Inter-state Commerce Commision. The railroads use twenty-eight per cent of the total output (6)204
of soft coal as fuel in their own locomotives, and have, therefore, an unique interest in the industry as the largest class of consumers. They are interested in the location and ownership of the reserves from the point of view of carriers as well as from that of their own fuel supply. They are interested in the markets, in wholesale and retail prices, in freight rates, in the quality which causes the coal to resist deterioration in transit and storage, in the competition of water routes, and in almost every other aspect of coal industry.

METHODS OF MARKETING

Most of the coal the domestic consumers buy, some of what the larger consumers buy, and a small part of what the railroads and other large consumers buy, passes (6)179
through the hands of dealers. Some fifty per cent of the coal is marketed by selling departments of the producing companies. These departments, however, do not always or even as a rule, sell directly to the ultimate consumers.

They may sell directly to retailers, or even to wholesalers, twice or more removed from the consumer. Wholesalers are a necessary factor in the process of distributing the coal mined by eight or ten thousand producers among some ninety thousand buyers of car-load lots; but there are too many of them just as there are too many mines and too many miners. In time of panic, by selling and re-selling to one another, and by re-consignment of shipments en route, (A)701 769 they resemble a stage army with its marching and counter-marching. Of retail dealers it is estimated that there are some forty thousand, one to every six or seven hundred families. That also is an excessive number. Both in the cities and in the smaller towns a smaller number could do the work more economically.

THE ANTHRACITE COAL INDUSTRY

PECULIARITIES

The production of anthracite is an industry with marked characteristics: compact, closely integrated, firmly established, self-confident, sohisticated, and a little arrogant. Its present status is the result of natural advantages and artificial control. The results of private ownership of railroads and coal deposits in the same hands or under the guidance of the same able minds are (1) lack of public regulation with a crude machinery or none at all for protecting the public interst; (A)36 683
(2) no provision for giving accurate information to consumers so that they might protect their own interest. Under a system of taxation on coal mined the evils mentioned are aggravated instead of corrected.

LOCATION OF FIELDS

The anthracite industry is concentrated in a small area of a single state. The deposits lie in eastern Pennsylvania, within a territory of 480 square miles. (16)5
Estimates of the total amount range from fourteen to (A)683
sixteen billion tons, about two-thirds of the original deposits. At the present rate of recovery it is estimated that our coal supply will last about a hundred years. (A)48
With the natural deposits of anthracite in one place, concentration of ownership was made possible, if not inevitable; the consolidation of ownership, operation and transportation in the same hands or in closely cooperating interests was favored; and the process of developing

a large scale manufacturing industry, for that it is as well as an extractive and carrying industry, was made much easier than it would have been if the anthracite deposits, like soft coal, were scattered all over the country. In location a better choice could hardly have been make, assuming there was to be only one place. It is surrounded in every direction by a relatively dense and rapidly growing population. Financiers and promoters could hardly ask for more congenial conditions and seldom have they improved a natural opportunity more judiciously.

OWNERSHIP

Ownership of the anthracite coal lands to-day (16)15
is highly concentrated. They are rarely offered for sale, and the full amount of the unearned increases in value, (A)677
a very great amount in the case of the more productive properties, which remain in the hands of those who own and operate them. Ninety per cent of the reserves is owned by ten companies, which have affiliations not only with the railroads of which they once were a part but (10)3
also with one another, dating from the time when they joined forces to diminish or eliminate competition, prevent new railroads from coming into the territory, stabilize operations and prices, and exploit the market. Though the combination no longer exists, so strong is the community of interest among the companies that we may with reason be sceptical of the possibility of forcing competition among them by legislative or judicial action. Thus the anthracite operators are divided into two main

groups. In one group are the ten companies operating on a large scale and producing seventy to eighty per (6)264 cent of the total output, most of it from their own lands and only a little on a royalty basis. They own something like nine-tenths of the reserves of coal; sell most of their product direct to retailers and individual consumers at constantly rising prices which formerly were uniform, agreed upon in advance, and which even now do not vary more than five per cent one from another. In the other group, forming an independent fringe of potential competition, are 160 or more operators who for the most part have no historic connection with the railroads, including fifty (A)683 or sixty who are engaged only in dredging operations. These independents produce only twenty to thirty per cent of the total output, and seventy per cent of that from leaseholds under royalty. They sell most of their product to wholesalers or jobbers, at prices somewhat below the prices of the companies in the periods of slack demand which formerly occurred, but considerably higher in the times of shortage which have been characteristic of recent years. (19)b

MONOPOLY

Occupying the center of the stage in the anthracite industry is a mighty though incorporeal figure, a composite of financiers, owners, operators, and railroads, known as the "anthracite combination." Historically and actually (A)36 it is a very conspicuous character, with an economic soul which survives legal sentence of death and dissolution, with an eye for conservative business but a sinister

countenance as seen by legislators, prosecuting officials, radical editors, and justices of the Supreme Court. The combination resulted from the application of keen foresight and shrewd business ability to the natural advantages presented by the location of the anthracite fields in a compact area within arm's reach of three-fourths of the population of the country. By agreement among themselves they limited output, pooled traffic, (A)36 and set prices. Annual production was stabilized at just the amount that the market would absorb at an advantageous price. Thus the combination controlled competition, restrained trade, ended overdevelopment, evened up seasonal fluctuations by a summer discount, stabilized operation and so gave regular instead of irregular employment to the mine workers. It improved methods in the mines below and on the breakers above ground, put financial strength with new processes, which brought cleaner, better prepared coal to markets, and established a reputation for standard qualities. (19)i

MARKETING POLICY

A policy of holding back rather than glutting the market is not to be condemned off-hand. (A)676 It is the policy which cotton growers and manufacturers, oil, and copper producers pursue when they can and lament their inability to carry out when they cannot. Only the very foolish destroy their profits by overstocking the market. If by any permissible means they can keep the supply below the demand and so keep prices stable at a high level they

will. With stationary or even diminishing purchasing power on the part of the mass of the population, there is always a possibility of glutting the market, with disastrous effects on prices. (19)w

PRICE

To the anthracite public the chief problem in the anthracite industry is the high price they have to pay at present. (A)2 Retail prices of anthracite in the principal cities practically doubled in the eight years from the beginning of the War in Europe. (6)239 If that were all there was to it, it might be explained superficially as merely one aspect of the general increase in prices due to the War. However the inflated prices of other commodities began to fall, most of them sharply, in 1918 to 1920, while the prices of anthracite have gone on increasing each year. The retail price is made up of (a) the price of the coal at the mine, including cost of production and producer's profit, plus (b) the cost (2)8 of transportation, plus (c) expenses and profits of the retail dealer, and in case he does not buy direct from a producer, expenses and profits also of one or more wholesalers. In the price of the domestic sizes there is a factor which does not appear on the surface and is not easily segregated. Anthracite is mined for domestic use in stoves and furnaces, but in the process of extraction and preparation a certain amount of the coal taken out of the ground is broken down into sizes too small for such purposes. The price at which coal is to be

sold is not determined by merely adding up the items of cost and then adding to the sum a customary or reasonable or satisfactory margin of profit. The consumer might naturally infer that the price which he pays is arrived at in some such way, since he always hears that any increase in wages, in freight rates, or in the cost of supplies is a justification or at least an explanation for an advance in prices. However, the price is determined in another manner. The starting point is not cost plus estimated profits but the consumer's needs. The price is fixed in such a way as to bring about an equilibrium of supply and demand. (6)208 Thus the price is determined by the company's forecast of market conditions in general; by the equilibrium between effective demand based on the two elements of (1) need for fuel and purchasing power, and (2) practicable supply based on conditions of production and transportation. Price is then further modified by considerations of policy, such as the advantage of keeping supply a shade under demand, of not going too far in alienating public opinion, the need for disposing of small sizes along with domestic sizes, consideration of the interest of railroads, their future as well as present traffic, and finally the desirability of presenting an appearance of competition by advertising superior qualities if not by cutting prices.

COST OF COAL

What it costs to get coal out of the ground and (6)239 loaded into the cars at the mine has more than doubled

in recent years. Increasing cost of production is to be (16)46
expected, of course, since mining is subject to the law (1)12
of diminishing return, except as it may be held in check
by increasing return from improved machinery, more
efficient labor, better management, better use of waste (2)18
or by-products, and so on. The cost of labor and capital
required to extract a ton of coal tends to increase as the
more accessible deposits become exhausted and operations
are extended to thinner beds, farther below the surface, with
greater complexity of operation due to folding, pitching,
crushing, and faults. As time goes on a larger and larger
proportion of the total must come from the areas of less
favorable conditions, and in all parts of the anthracite
region deeper and thinner beds must be worked each year to
maintain output. The basic item in producer's costs, which
determines whether they are high or low, is waste. The other
items may be grouped under two general heads: supplies, (6)237
repairs, and maintenance; and general or overhead expense.
The cost of each of the three factors has increased, but
they have increased in different degrees. Attention naturally
centers, first on the cost of labor, since it is by far the
largest single item and has increased more than the others.
It is the one with which we are most familiar, too, for every
increase in wages is prominently discussed in the public press
before and after it is made. The second item in costs, which
includes operating supplies, repairs, maintenance, and light
and power in so far as they are not produced by the company,
depends on the general market level of prices for the
commodities used, modified by the degree of administrative

efficiency in buying and using them. This item may be
swollen by improper charges, as for example, when a
company buys locomotives and charges them to operating
expenses; or when a company builds a new power plant,
and charges to the supply account the difference between
its cost and the value of the old one which it replaces.
The third item, general expense, may not excite any more (A)917
interest than the second, at any rate until it is broken
up into its constituents. But it is by no means an
innocent or homogeneous item. Therefore included in this
item of general expense are fragments of cost which should
not escape attention. (19)d

DEPRECIATION METHODS

The methods in use for charging depreciation are
many and varied. Some companies carry no depreciation
account, while others make a charge at a fixed rate per (A)955
ton of coal produced. Others charge a fixed amount
annually based upon the probable life of the equipment.
Charges may be more than would be necessary to keep the
capital account intact. For example, a piece of machinery
is used twice as long as its estimated life. After the
term of its natural expectation of life has ended,
depreciation is still charged up year after year at
the same rate, through the period of its abnormal life,
so that by the time it is finally discarded, the depre- (A)955
ciation reserve which has been set up on its account
exceeds its original cost. All such inflated depreciation
charges, and to a larger extent the practice of treating

costs of plant and equipment as operating expenses, increase apparent costs as shown by the books and decrease apparent margin of profits. These methods do not actually increase the amount of money the operator has to expend, but they give a false idea of the relation between costs and profits.

MINING TAX

In the state of Pennsylvania there is assessed (6)289 a one and a half per cent tax on the value at the mine of the anthracite prepared for markets. The producers naturally adds the amount of it to the price they charge, and so it is passed on, all along the line of wholesale and retail dealer, until it reaches the ultimate consumer in his bill.

LABOR COST

There is no simple way to decide whether or not it is reasonable that we should pay $4.05 for the labor (6)242 involved in getting out a ton of anthracite. A high labor cost may or may nor mean good earnings for the (A)317 miner. Part of it may be due to poor management, which keeps men waiting for tools or cars or otherwise hinders them in their work. In the absence of any convenient measuring rod, what we have to do is to examine the conditions under which the men work, the wages they get, and the kind of lives they can live, so far as that is determined by environment and income and what it will buy; and from all these varied data form our opinion about the labor cost and the merits of the current controversies in the industry. The man who cuts out the coal with pick or machine and blasts it down is practically

a subcontractor. He is usually paid on the basis of the amount of coal he gets out. He is called a contract (12)21 miner and he usually employs a laborer to load the coal he blasts down and help him in other ways. The laborer is the employee of the miner, and not of the company. He is hired, disciplined, and discharged by the miner, and paid by the company, on a statement turned in by the miner, either a fixed daily rate or a certain portion of the miner's earnings. The rest of the force, working some (8)10 above ground and some below, are blacksmiths, drivers, timber cutters, culm men, etc. They are time workers, paid by the day or the hour.

STEADY EMPLOYMENT

By the award of 1903 and succeeding agreements, (6)305 rates of pay for all classes of work have been increased (A)497 substantially and the length of the working day has been cut. Simultaneously, by the action of the operators in stabilizing output, the seasonal aspect of the work, which was characteristic of the anthracite industry before 1900 as it is of bituminous coal mining today, has disappeared, and regular employment can be counted on. The anthracite miners are no longer a submerged or exploited group. In bargaining power their relative strength has increased until at the present time they can hardly be said to be at a disadvantage in negotiating with the operators.

WORKING HOURS

The standard ten-hour working day of 1902 was reduced to nine hours in 1903 and to eight in 1916. The (6)305

chief significance of the length of the working day lies in its relation to wages. It is the basis for wage rates for work paid by the day and for calculating the earnings of day men. It does not mean that all mine workers (A)405 work eight hours a day. In practice a number of the day men work more than eight hours, and a considerable number of the contract men work less. Contract men determine their own hours, very largely. They have their idea of what is a day's work, in output or earnings or weariness or combination of the three, and stop when they reach that point, or when they think the air is unfit to work in.

LABOR TURNOVER

In total turnover of labor there was in 1921 a range from nine per cent in one colliery to 374 per cent (6)319 in another, both in the Wyoming District. In the most (A)497 stable district, the Lehigh, the proportion of employees who were on the payrolls throughout the entire year ranged from 56 per cent in one mine to 84 per cent in another. According to the figures given, the outside day men are the most stable group in the anthracite mines. The contract miners and inside day men are not far below them. The greatest amount of change takes place among the miners' laborers, the men who are the personal assistance of the contract miners, hired and fired by them individually and not by the company. (19)m

ACCIDENTS

Anthracite mining is hard work, not likely to attract men who are not strong. It is safe to assume (A)427

that the anthracite mine workers have a higher average
of native physical strength and resistance than most
other occupational groups. Among the coal miners of
the United States accidents are the principal cause of
death. The rate of fatal accidents per thousand men (5)12 14
employed is higher than in any other important coal (6)89
producing country, three times as high as in Great (3)5-8 8-11
Britain. There are many reasons why accidents occur 11-14
and why the high rates persist. Natural difficulties (16)157
increase as the workings go deeper. Increased use of (A)631
machinery and of electricity increases dangers. The state
operators and miners cannot agree on proposals, and therefore
state laws do not cover present conditions in the mines.
Even yet, for instance, the state has no electrical code.
The state does not make adequate provision for inspection.
The twenty-five inspectors in the anthracite field are men
of long practical experience, generally trusted and respected (16)95
by both miners and officials; but a man with fifteen
hundred miles of underground gangways and workings in his
inspection district cannot get over the territory
frequently. Since the War there has been a decline of
interest, on the part of both the men and the companies,
in the training for first aid and rescue work which has
been fostered by the operators since 1904. Such training
is valuable not only because of the preparation it gives
the men for action in emergencies, but also for the effect
it has on their attitude toward taking risks. It makes
them realize the consequences of accidents, decrease their
carelessness and their scorn for regulations in the (A)627

interest of safety; in short it is one of the best educational devices for transforming a reckless chance-taker into an example of caution. (19)u

WAGE SYSTEM

The wage rates have no scientific basis. There (19)q
is no system. Different amounts, which may or may not (6)325
be equitable, are paid for work which is called by the (A)343
same name and which may or may not be essentially the same. There are different day rates for the same occupation, as many as six, for example, for slate pickers in a singel colliery; and frequently there are no specifications to indicate under what conditions each rate is applicable. How the combination of wage rates, length of the standard working day, number of days' work in the year, amount of voluntary absence, rate of turnover, and other conditions work out in terms of annual income; and what kind of life the annual income and the conditions under which it is earned allow for himself and his family in the place where they must live, are the practical questions which concern the individual mine worker. They are questions with which we, who are trying to piece together a just conception of the anthracite industry, are concerned; for the standard of living of the wage earners in any industry is one of the points on which it must be judged. From information given by the operators to the Coal Commission it was found that during the year 1921 the average annual earnings attached to all positions in the anthracite industry were $1,605: contract miners $2,065, miners' laborers $1,450, (6)325

inside day men $1,535, outside day men $1,475. Since (7)22
this data was collected, wages rates have been raised (8)12 (16)111
ten per cent for all kinds of work. Whether this
addition to the rates has increased the annual earnings
of all groups uniformly by ten per cent is a matter for (19)f
speculation.

FAMILY CONDITIONS

In most mining communities, even in the anthracite
region, the opportunities for other members of the family
to earn money are restricted. They can take in lodgers (6)307
or boarders. The sons can work on the breakers as soon (11)70 32
as they are old enough. The Census of 1920 found that (14)210 (15)87-119
in over half the homes of the anthracite workers there
was only one wage earner, and that as might be suspected (A)553
from this, boarders were taken in. The facts do not indicate that labor is overpaid. The work is severe and
the hazards are great. Incapacity comes at an early age
even when disabling accidents are escaped. Serious
misfortune does enter their families. An annual income
of $2,000 or even $2,500 is not an extravagant allowance (A)456
for the support of a workingman's family at the present
level of prices.

The anthracite mine workers are relatively a settled and stable population, and they live for the most part in settled communities. Many of them, especially of the men who do the actual mining of the coal, are sons of miners; and many of their sons will be miners after them. The mothers dread it for their children, on account of the risks, and would rather have them do almost

anything else; but it is the work that is at hand for the (8)15
boys as they grow up, and many of them go into it for
that reason if for no other.

SANITARY CONDITIONS

Nineteen sample anthracite communities were rated
as to their sanitary conditions for the Coal Commission (15)120
by the United States Public Health Service. The general 145
ratings, based on weighted estimates of water supply, 87-119
sewerage, sanitary control, activities for the prevention (6)311-316
of disease, environment and habits of the population,
ranged from 80.8 points for Wilkes-Barrie out of a (A)614
possible 100, down to 21 for a small company owned town.
Only six of the nineteen received ratings above 60. On
the whole, the cost of living is higher in the anthracite
towns than in other places with which comparison is (7)36
appropriate. Coal of course is cheaper, rents are lower, 61 43
but the houses are inferior. The typical home of the (8)12
anthracite mine worker is a two-story detached frame house
of five or six rooms. Often it has running water in the
kitchen and electric lights, but rarely an inside toilet.
Bath-rooms which for miners should be considered a necessity,
and which we flatter ourselves are established features (A)609
of the American standard of living, are scarce. Taxes are
an appreciable item. Every miner pays an occupational
tax, and he and his wife pay a school tax, whether they
own property or not.

Hard and dangerous and fairly well paid work in an industry which is prosperous and stable; the protection of a state law limiting employment as a qualified

and responsible miner to those who have certificates, to be obtained not otherwise than by two years' service in the anthracite mines and then satisfying the examiner; the further protection of a powerful union, and the standard of living are reflected in varying degrees and combinations in the daily life of the miners.

OTHER REASONS FOR THE SHORTAGE OF COAL

Getting the maximum amount of coal from each seam that is opened does not necessarily have a favorable influence on current prices. It is more likely to increase the average cost of production, however desirable it may (A)653 be for other reasons. There are wastes of various kinds, however, in the processes of production which decrease the amount of marketable coal below what it might be per man employed and per dollar invested, and so limit the supply and increase the price. Most conspicuous among (A)659 these are the general suspensions due to the termination (A)329 130 of the wage contract. These suspensions stop production entirely for weeks at a time and have been responsible for all the acute shortages in the anthracite market except during the eighteen months of the War. There are other factors which contribute more steadily, if less dramatically, to the condition of shortage in supply.

OPERATOR'S PROFIT

As to margin of profit, this is a question even less simple to answer than whether the cost of labor used in producing the coal is too high, even when we (6)242 253 have access to the companies' books, as the Coal (8)20 (13)18 Commission had. Accounting practices are not uniform 33

and in many cases the accounts are incomplete or confused. There is no accepted standard as to what should be included in profits, or as to the basis on which to figure returns on investments.

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THE BITUMINOUS COAL INDUSTRY

PECULIARITIES

If anthracite is the aristocrat of the fuel family, then the soft coal industry is an awkward, overgrown adolescent, or a friendless, sprawling giant, at home in three-fourths of the states, most at home in the very one which has the monopoly of anthracite, hiring four times as many men to do its work, producing five to seven times as much tonnage, carrying on its massive, unsteady shoulders the manufactures and the commerce of the nation. The bituminous coal mining industry has characteristics quite as individual as the anthracite indsutry, but they are a different set. The wide distribution of the deposits, their practically unlimited amount, and the ease with which small mines can be opened, prevent anything like the anthracite combination, and furnish the antecedent condition, though not the active cause, of the over-development which is the notorious characteristic of bituminous coal mining. These circumstances also account for the variety of economic aspects which the industry presents, ranging from the most primitive to the most highly organized. (2)65-75 (A)205 211 228

OWNERSHIP

Both ownership and operation are widely diffused. The United States itself owns about twenty million acres of coal lands, administered by the Secretary of the Interior under a leasing law enacted by Congress. (2)6 (A)205

Railroads, public utilities, steel manufacturers, and other large industrials have bought coal mines for the purpose of making sure of their supply of fuel. (14)258 (6)262

UNION AND NON-UNION TERRITORIES

The division between railroad companies and independents in the anthracite industry has its counterpart here in the division between union and non-union territory; the division being about two-thirds and one-third respectively. Non-union operators pay lower wages and keep down costs in other ways. Partly because of this, and partly in some cases because of the superior quality of their coal and favorable freight rates, they can keep their mines running with fewer interruptions, even in times of industrial peace. In times of strike they not only do not have to shut down but have every reason to keep on operating to capacity. From one point of view therefore, this non-union third of the industry is looked upon as the nation's only protection against disaster in case of a prolonged strike. (A)1317 1304 1336 (6)333 (14)224

COMPETITORS OF BITUMINOUS COAL

Just as anthracite has been giving up some of its market to bituminous coal, directly or indirectly so bituminous coal has been losing part of its potential market to other fuels and water power. This cannot go on indefinitely, because the supply of these competitors is limited. But it may give the coal industry leaner and leaner years for a while, until the supplies of natural gas and of cheap oil are exhausted and the available water power has been developed to its maximum capacity,

unless at any rate, the price of coal comes down.

PRICE

Prices of bituminous coal, as of anthracite,
more than doubled between 1916 and 1922, but unlike (14)58
(12)1
those of anthracite, they are exceedingly sensitive to (6)246
economic forces. There is no artificial influence at
work to keep them at a high and steadily increasing
level. They fluctuated sharply in those six years,
and since 1922 have gone pretty steadily down. A large
part of the total output of soft coal is sold on
contract. The proportion varies greatly from time to (6)195 (19)o
time and from district to district, but it averages
perhaps seventy-five per cent over the year for all the
tonnage. This large proportion of contract coal has a
stabilizing effect on average prices. One of the conditionsto which spot prices are particularly sensitive
is the amount of coal which consumers have in storage.
Prices do not respond immediately to a drop in production
or a shortage due to difficulties in transportation unless
the stocks on hand are already depleted. But whenever (A)1835
stocks get down below thirty million tons the price
tends to rise sharply, while on the other hand it tends
to drop as soon as they are built up, until by the time
they get above forty million tons consumers are in (19)s
position to make their own terms.

COST OF PRODUCTION

The cost of production, as in every other aspect
of soft mining, has varied. The variations are the net (6)244
result of the interaction of many factors, some operating

to increase and others to decrease costs, and they can be explained only by intimate knowledge of local conditions. In general the costs are higher in the west than in the (A)2007 east. (19)e

WASTES

So enormous are the wastes in the mining of bituminous coal under present conditions that it requires no great amount of acumem to discover that this is the (14)103 (6)283 strategic point for reducing cost of production. Coal left in the ground or otherwise lost to recovery in the process of production is a form of waste which, deplorable as it is, affects current costs favorably, at the expense of future generations. It results, that part of it which is unnecessary, from doing things in the easiest or the cheapest way. Engineers estimate that ten states which are producing ninety per cent of the bituminous coal today, (A)1852 there is a total loss of about thirty-five per cent of the 1853 1840 coal, and that considerably more than half of this loss 1838 1138 might be avoided. Many mines are not laid out according to good engineering methods, or there is carelessness or bad engineering in carrying out the original plan, with (A)1858 resulting irregularity in the workings. This not only increases current costs, but it leads to abandoning rooms, when demand for coal slackens, before they are worked out, allowing them to stand idle until the roof caves and the expense of reopening becomes prohibitive. Coal which might be taken out is left on the roof and bottom and in pillars. Pillars are left to protect oil and gas wells and to prevent subsidence of the surface, when back-filling or

other means of accomplishing these same ends might be
employed. Pit cars are loaded too high, so that coal
falls off in transit and is ground under foot. Cars (A)1862
with poor doors or wide cracks are used, which let the
fine coal sift out and stay in the mine, incidentally
adding to danger from coal dust explosions. Among the
wastes which add to cost of production at the present
time, and so to prices, are first of all those which (19)a
are covered by the term overdevelopment.

OVERDEVELOPMENT

The maximum demand for soft coal in any year
thus far, as measured by production, has been 579,000,000
tons; the average at present is about 500,000,000 tons.
But the mines are equipped and manned to produce (12)5 (6)270 272
about a billion tons. That is, to take an example, (7)92-93
if all of them had operated full time in 1923, instead (14)57 168 265
of 179 days, as they did on the average, their total
output for the year, assuming the same number of men
at work with the same average daily productivity, would
have been about a billion tons. Putting it another way,
which takes into account the irregularity of demand,
the capacity is sufficient to produce at least twenty-five per cent more than the highest rate attained in
periods of greatest demand. (19)j t

RESULTS OF OVERDEVELOPMENT

The causes of this overdevelopment are the
accessibility of the deposits to any man of enterprise;
the relative ease with which a mine can be opened when
there is an inducement for doing so, and its tenacity of

life once it has begun to operate; the seasonal fluctuations in demand tending to add a little permanent new development to the industry every winter. Its consequence is idleness of men, mines, and equipment for about a third of the year. Both capital and labor (A)1867 1874 must be supported by the public year around, even though they do only two-thirds of a year's work, and the public (A)1111 meets the bill, which is swollen by costs of deterioration and demoralization of various kinds. Irregular operation increases the accident rate, for example, and it is (19)1 n responsible as noted previously for a considerable part of the coal that is lost to recovery.

IRREGULAR OPERATION

How much unnecessary expense of irregular operation is added to the cost of production of each ton of coal was calculated by engineers of the Coal Commission from actual records of a representative number of mines. When the mine operates every possible working day during the month the cost per ton produced is of course lowest. (A)1867 Each idle day adds to the unit cost of producing the month's output, for there are some costs which must go on whether the mine operates (A)1959 1966 or not. In the second place, there are the wastes due to backward handling of engineering problems and of working force. In the laying out of mines and in general installation the large companies have usually appreciated the importance of technical knowledge; but the older mined, and the smaller ones, are naturally at a disadvantage, and they pay dearly on every ton of coal

they mine for initial errors of design and installation. (19)h p

BACKWARDNESS OF THE INDUSTRY

In underground management, both large and (19)u
small mines compare unfavorably with the best practice (A)1867
in other industries. In control of underground traffic
and in coordination of operations, coal mining is still (A)1918
in the primitive stage from which the manufacturing
industries, generally speaking, have emerged. Although
there are wide divergences in natural conditions, the
general scheme of underground work is quite uniform
throughout the country, and uniformly backward. Under-
ground, unseen, a quasi-military type of organization (A)1282
has survived, allowing little if any functional
supervision or control. Foremen, although they have a
distinct legal status in some states, and everywhere have
very heavy responsibilities, are not trained, and their
qualifications ordinarily are not tested. Superintendents,
managers, foremen, and assistant foremen or bosses are (A)1915
very generally without the specialized and differentiated
preparation and qualifications which under a sound and
efficient system of management their duties would require.
The miners themselves have a less active and a more
obstructive part in management than would be desirable.

IMPROVEMENTS

Engineers see great room for improvement in the
very respects in which American mining has been supposed (A)1966
to be, and no doubt is, superior to that of European
countries, viz., in the use of mechanical devices
whose economy and practicability have been fully

demonstrated, and in standardization of equipment. (6)133
They estimate that by the general use of machine loaders the total cost of mining coal might be materially cut down reducing it in many cases by not less than thirty per cent. From the point of view of commercial practicability, it must be said, their use is still experimental. Lack of standardization extends to type and size of mine cars and motors, weight and guage of (A)1959
track, and almost every other feature of equipment. Even more serious is the poor adjustment between the supply of mine cars at the workings and the miners' need for them. That mining can remain profitable both to investors and to mine workers under lower prices to the consumer is certain, but only if traditional underground methods are abandoned, friction reduced, the technical knowledge and good-will of the miners utilized, (A)1943
double or multiple shifts introduced when practicable, mechanical loading and electric drilling used as (A)1914
generally as machine cutting is now used in most districts, and all artificial obstacles removed from the natural process by which low cost mines force high cost mines out of operation for the time being or into advantage consolidation under public supervision.

EXCESSIVE SUPPLY OF LABOR

In striking contrast to the number of anthracite (A)1264
mine workers, which keeps almost constant, the number of 1265
men in the bituminous coal industry increases from year to year almost without interruption, and with little perceptible relation to demand or to prices or to output.

About eighty-five per cent of them work underground and the balance on the surface. Sixty per cent are tonnage men, operating the cutting machines, mining with picks, and loading as distinct from the day men, (A)1165 inside and outside, most of whom are engaged in subsidiary occupations. This is a larger proportion of miners than in anthracite, for bituminous coal mining is still more prominently an extractive industry and less a manufacturing industry than the mining of anthracite.

SETTLING DISPUTES

In the strong union districts, relations between the miners and the operators are governed by collective agreements and by decisions made under the agreement, supplemented by custom in the case of matters not covered by the agreement. There is machinery for the (12)69 adjustment of disputes and grievances, consisting of a pit committee at each mine, elected by the workers, to take up questions with the management, and more elaborate machinery for deciding disputes on which the pit committee and the management cannot agree. In non-union districts there is little organization of labor relations. Some companies have devised plans of employee representation and machinery for adjustment of disputes similar to that found in the union districts, but the typical situation is purely individualistic. The individual workman deals with his foreman, and if not satisfied he is free to carry his complaint to higher officials of the company.

OPERATORS' ORGANIZATION

Employers and workers are not unevenly matched in the bituminous branch of the coal industry. At first it seems otherwise. The United Mine Workers, with their well knit organization, their able leadership, their record of many victories, would appear to be altogether too strong for the badly organized, highly competitive body of operators; and this impression is strengthened by constant pleas of helplessness from operators, especially from those outside the central competitive fields in unionized districts. There is no national organization of operators corresponding to the Policies Committee and the representatives of the operators on the Conciliation Board in the anthracite industry. The (12)39
National Coal Association, which includes both union and non-union operators, deliberately excludes questions of labor relations from its cognizance. The operators in particular states, or within the territorial limits of districts of the union, have local associations, sometimes more than one; and it is with these various local associations that the United Mine Workers make their collective bargains.

THE CENTRAL COMPETITIVE FIELD

The basic scale is first set for certain districts taken as basic points in the Central Competitive Field, which includes Illinois, Indiana, Ohio, and Western Pennsylvania. The outlying districts then make their agree- (12)49 (6)219
ments on the same basis, but with established differentials. Contracts in all the districts expire on

the same date. The system has more advantages for the miners than for the operators. All that is necessary to secure an agreement as wide as the union territory is to get a start, because if some operators sign up, others in order not to lose orders, must promptly fall in line, especially after a suspension when prices are apt to be high and demand insistent. Operators in union territory outside the Central Competitive Field have a real grievance in (A)1332 1362 having no voice in the negotiation of the basic scale. Their employees are represented through the international union. Their competitors are the party on the other side of the table. They themselves have not even the role of unofficial observer. Nevertheless they are constrained to acquiesce. They cannot strike against the Central Field. Year after year they see those features of the wage scale to which they object retained or even modified to their further disadvantage. The three year agreement negotiated in the spring of 1924 apparently leaves the Central Field (A)1288 1378 in a stronger position than ever in relation to other 1380 union fields, but the working out of the agreement seems to be threatening to put all union territory at a disadvantage in the competition with the non-union operations. Terms of warfare are odious when applied to industry, but no other terms describe the existing strife. The union and the union operators, the union and the non-union operators, are in fact belligerent. They fight not only with economic weapons such as strike, lockout, blacklist, (6)274 333 347 closed shop but also on occasion with automatics, rifles, (13)36 (14)244 machine guns, and bombing airplanes. Operators ,who are

determined to have no relations with the union, press into service the very organs of local government.

REASONS FOR IDLE TIME

Over a period of thirty years bituminous coal miners have had on an average a chance to work 213 days a year, thus losing ninety-five days. This average means employment for seventy per cent of the normal year. (6)272 (7)93 Lack of market is the fundamental explanation for nearly all the idle time. Physical disability of the mine accounts for a little, car shortage for a great deal at certain times and in certain places, but that is usually reducible to other causes; and even lack of labor for a good deal, in times of local or widespread strikes. But the overwhelming reason why the soft coal mines of the country do not run more regularly is that the country cannot use anywhere near as much coal as they can mine.

Complaints are often heard that the men do not work as regularly as the mines, that they do not want (A)1111 1120 to work regularly. No doubt the irregularity and uncertainty of employment tend to demoralize the working habits of the individual. No doubt, too, miners as a group are more individualistic in their attitude towards their work than city workers and less cheerful slaves of routine. Intermittent employment tends naturally in the first place to attract men who prefer to alternate work with idleness, and in the next place to breed laxness among those of regular habits.

ACCIDENTS

Much too frequently in the bituminous mines there

are terrible explosions. Some mines are gaseous, and (A)1713 1718 require constant vigilance to keep them safe. An 1725 accumulation of gas or of imflammable coal dust may be ignited from the flash of a broken electric circuit, a lighted match, or even an open lamp, and the mine blown up with the loss of scores or even hundreds of lives. In addition to the influences which tend to keep the accident rate high in the anthracite mines, in the bituminous coal mines there is the powerful factor of irregular operation. Idle days increase accidents. For some accidents, especially the explosions of a major sort, the management of the mines ordinarily must be held responsible. The poor ventilation, or the whole series of operations, undercutting, loading, (3)8-11 (6)359 gathering the cars, and hoisting, is carried on at a (14)76 speed so great as to be almost or quite incompatible with the prevention of accidents. Our present rate of production is certainly maintained at the cost of human lives. Machinery, equipment, and explosives may be of a kind which has not passed the tests and been approved by the federal Bureau of Mines.The best preventive of accidents, especially of the more numerous individual accidents, is the careful miner. Safety councils, on which both management and labor are represented, carrying on a constant and practical education of all mine workers, including foremen and others in authority, are a practical methods of raising the average individual carefulness. Safety laws are necessary and those which we now have need strengthening from time to time in the light of

experience. The conditions of various kinds which have been found to favor a low accident rate may be summarized as follows: a good state mining code with appropriations sufficient to provide adequate inspection service of a high grade; competitive insurance under control of the state with merit rating of individual mines; certification of miners in the hands of an impartial and competent body; development of the mine according to a pre-arranged plan; the use of only permissible explosives and equipment; intimate knowledge of underground conditions by owners or their represevtatives with a close relation between them and the manager or superintendent; a good safety organization in the mine; cooperative labor relations (A)147
resulting in a low labor turnover; a disposition to be content with a moderate output; and steady operation. The Coal Commission predicted that unless the economic motive for safety and an ordinary decent respect for human life gradually becomes more effective in making the mines safe for miners, the question inevitably will arise whether more drastic legislative interference may not be necessary, even if this would mean less coal mined (19)r
per man and at a higher cost.

WAGES

Earnings are the product of wage rates and time worked. As in anthracite, the wage rates in bituminous coal mines are either piece rates or time rates. Because of (6)322
the short and irregular year a relatively high level of (12)139
171
196
both tonnage and day rates has been forced on the
205
bituminous coal industry in the unionized fields, and in

the non-union fields of the west where rates are as high as or higher than in the union areas. The best expectation of earnings for a tonnage man is about $8 a day, or from $1,600 to $2,000 a year according to opportunities for work; of a day man, $7.50 a day, or about $2,000 a year, less by the day but as much or more for the year because (19)v g of a more stable working year.

FAMILY CONDITIONS

As a group the men who work in the soft coal mines of the country are a little younger than the anthracite mine workers. A larger proportion of them are (A)1414 1416 1418 1426 native born American, including a considerable body of Negroes. As compared with the Anthracite workers the foreign born have not been quite so long in this country and fewer of them are naturalized. A somewhat larger (6)308 310 proportion are married and maintain homes and not so many (15)87 are boarding with their own families. Families are large. On the whole, the personnel of the industry is not quite so mature and settled as are the anthracite miners. To a great extent, therefore, the bituminous coal miners and their families are dependent on their employers for the character of the homes in which they live, and the resources and the the atmosphere of the community of which they are a part, as well as for the conditions under which they work. In respect to physical comfort, educational advantages, opportunities for recreation, and the protection of health, the miner's (7)44 (11)8 70 family in a company town may be better off or worse off than the average workman's family in an independent town or (A)1433 1437 city. Whether better or worse, there is little he and

his family can do about it.

SANITARY CONDITIONS

The sanitary surveys made for the Coal Commission
by the United States Public Health Service note a general
absence of bath houses, of playgrounds for children,
of sidewalks, grass, flowers, trees, and gardens, even
of paved streets, and the acceptance of such conditions
by the inhabitants. It found generally lower ratings (A)1441 1443
for water supply than in the anthracite region and the 1444 1445
actual presence or records of recent outbreaks of typhoid 1447 1449
fever in several of the communities; general backwardness (14)84
in protection of foods; inadequate provision for the (11)8 (7)44
removal of refuse; ineffective and inadequate measures (6)312 (15)120
for the prevention of diseases; and especially the failure
of most places to have some one person responsible for
public health activities. All of which is summed up in
a comment that the general sanitation of a coal town
is relatively low.

HOUSING CONDITIONS

Among the causes of grievances, controversy, and
violence are the terms on which miners occupy the company (A)1429
houses. They are not tenants with the ordinary rights of
tenants in their relation to landlords, but rather bear the
relation of servants to master, like a domestic servant in the
home of her employer. The explanation of this is that the
houses are built because the coal cannot be mined without (6)315
labor, and often there is no place for the workers and their
families to live unless the company builds dwellings for
(A)1437

them. The houses are built for the very practical purpose of inducing workers to come and stay, and they are only as good as they need be for that purpose. They are built on company land with company capital and are as much a part of the general investment in the (A)2540 mining enterprise as the branch railroad, switches, mine shaft and tipple, and the company store. They are built for employees and if a tenant ceases to be an employee, or even to be a satisfactory employee, he is no longer wanted as a tenant. As long as he is an (19)c acceptable employee he is a desirable tenant.

OPERATOR'S PROFIT

Operators, as a group, are affected by the instability of the industry as adversely as are the miners. As individuals it gives them a gambling chance for fabulous gains, the earnings of capital are as irregular and (A)2537 uncertain as the earnings of labor. Margin of profits of individual operators and the rates of return on their (7)89 invested capital range in any year from serious losses by (6)242 some to spectacular gains by others. Average margin of profits and average rates of return for the industry (A)2544 fluctuate widely from year to year and from district to 2570 district. All the available figures disclose that 2680 possibilities of extravagant gains, risks of disasterous losses, alternations of feast and famine, uncertainty from year to year, are the characteristics of this unstable industry. (19)k

PART IV

CONCLUSIONS AND DEDUCTIONS
ON THE ECONOMIC PROBLEMS OF COAL MINING
IN THE UNITED STATES

CAN THE OPERATORS HELP?

In the anthracite industry, what the operators can do that would be most appreciated by consumers is to increase their output and lower their prices. On the whole they are making big profits, on whatever basis profits are calculated. As we have seen, a small group of operators, owning nearly all the reserves and having among themselves and the railroads at least in the legal sense a combination, restrict their output rather than extend their market. As a result the public has given more attention to the question what can be done to the operators than to the question which we are now considering, what can be done by them.

The anthracite companies could prevent the steady rise in the price of their product from year to year. They can sink more shafts, employ double or treble shifts of workers, use more labor-saving machinery, and improve labor relations by more attention to personnel management. They might give the same amount of attention to personnel management, scientific job analysis, that they now give to engineering and sales. It is a fertile field that has hardly been scratched. There is no telling what results might follow a transforming of the miners' union, with which all anthracite labor contracts are made, from a belligerent, militant organization into a cooperative factor

in the mining of coal. Here we must recognize that it involves a new policy on the part of operators, a policy which calls for imagination and pioneering statesmanship equal to that of the first anthracite operators and that of the creators of the anthracite combination. It means offering inducements, not only pecuniary, but social and psychological. The industry must function as a whole from top to bottom, from financial control through engineering, management, supervision, drilling, blasting, loading, hoisting, breaking, sorting, cleaning, carrying, and selling. The anthracite industry comes nearer doing this than does the bituminous industry but it falls short at the very points where the interests of labor and those of consumers are to be reconciled with the competing interests of owners and of operators. To fall short there is to fail. The interest of workers and the interest of consumers are the primary, not the secondary interests. Sound national policy in anthracite demands cheaper fuel and more of it. Whether those in financial and operating control will work to accomplish these ends with the singleness of purpose and determination essential to success is for them to decide.

"STORAGE" - NECESSARY IN THE BITUMINOUS INDUSTRY

In the soft coal industry the operators share in (4)1 general the vicissitudes of the business cycles. They are more active, more numerous, and more prosperous when there is a boom, when there is brisk trade in steel and other industries. On the other hand, more idle, less prosperous, and quickly diminishing in number when there in the mining of coal. Here we must recognize that it involves a new policy on the part of operators, a policy which calls for direction and planning on commercial equal to that of the first anthracite operators and that of the greatest of the anthracite organization. It means affecting individuals, not only personally, but socially and psychologically. The industry must function as a whole from top to bottom, from financial control through engineering, management, supervision, drilling, blasting, loading, hoisting, breaking, sizing, cleaning, shipping, and selling. The anthracite industry comes nearer doing this than does the bituminous industry but it falls short at the very points where the interests of labor and those of consumers are to be reconciled with the competing interests of owners and of operators. In that event there is to deal. The interest of workers and the interest of consumers are the primary, not the secondary interests. Sound national policy in anthracite demands cheaper fuel and more of it. Whether those in financial and operating control will work to accomplish these ends with the singleness of purpose and determination essential to success is for them to decide.

"BUSINESS" - PROSPERITY IN THE BITUMINOUS INDUSTRY

In the soft coal industry the operators as shown in (1 general the vicissitudes of the business cycles. They are more active, more numerous, and more prosperous when there is a boom, when there is brisk trade in steel and other industries. On the other hand, more idle, less prosperous, and rapidly diminishing in number when there is a depression. The response of the coal industry to general financial and industrial changes is not, however, instantaneous. Prosperity and depression in the coal industry depend upon contracts and on the stocks of coal in storage. If stocks are low operators may feel an improvement in business almost instantaneously. If they are large a considerable interval may intervene. Prices may be controlled more effectively through storage than by price-fixing. In the absence of storage and of dependable contracts, prices fluctuate violently, and operation fluctuates with prices. Whatever, therefore, operators can do to increase the practice of buying on contract is in line with sound national coal policy. There is no other industry, not even agriculture, in which there is so sensitive a margin of production. At a high price all the coal banks and wagon mines can work profitably, and the large operations can extend their production up to the limit of transportation service. As the price falls, high cost mines begin to drop out. At the lowest prices only operators who can cut wages or who have exceptionally favorable freight rates or other advantages, or those who are operating on long contracts, can afford to continue. There is no complete solution of the problem of irregularity in the coal industry without a solution of the general problem of business and industrial cycles.

NEED FOR CONSOLIDATION IN THE BITUMINOUS INDUSTRY

The greatest requisite of the operators in the bituminous coal industry is consolidation. By this we

mean better organization, consolidation of properties, and association for determining and carrying out labor policies, sales policies, and engineering policies. This process is going on, though it is more or less concealed in available statistics. Over a period of fifteen years the number of operating units seems to have remained distributed among large, medium, and small producers in almost the same proportion. Consolidations are essential for much the same reasons that justify the consolidation of the railroads into several large systems, each uniting some high cost and less profitable lines with some of the more profitable lines. Through consolidation there would be substantial economies in administration, as the elimination of wasteful and injurious competition, the closing down of high cost collieries, the concentration of car service in times of shortage in places where it can be used most advantageously, the increase of contract sales, and the use of labor saving machinery.

Some modification of the Sherman anti-trust law (10)51 may or may not be necessary. To some extent the complaint of operators is justified, that their cut-throat competition is imposed upon them by law. To this extent the law may safely be modified, on condition that the object which the law had in view is attained by federal supervision. The public cannot afford to see the anthracite combination duplicated in the bituminous industry. The practical alternative, however, lies between combinations in defiance of laws and public opinion, and a policy of consolidation and integration, under public control, with

full public knowledge, and with the proper safeguarding of the public interest. Consolidations are not forbidden by the anti-trust laws, only combinations which restrain trade. There is little danger of such a degree of consolidation in the bituminous coal industry as will prevent competition. The coal is too widely distributed for any conceivable monopoly of production. Operators will do well to accept cheerfully the principle that the securities issued by new corporations shall be scrutinized and the conditions of consolidation approved by a public authority in the public interest.

Bituminous coal operators, then, can help matters by uniting into larger units, with resulting economies in overhead expense, greater efficiency both in operation and in selling, and better cooperation with both carriers and consumers. When actual consolidation is not desirable or practicable, some of its advantages may be gained by cooperation among producers. Let bituminous operators organize, quit ruinous competition, come to an understanding with one another, with the mine worker, with carriers and consumers, and there will be little difficulty in coming to an understanding with the public. For the public consists of coal consumers, and the public interest primarily requires that there be peace with justice in the industry and service at a reasonable cost to the nation.

GENERAL IMPROVEMENTS

Among the improvements necessary to make the coal industry more a functional service and less a business speculation may be enumerated the following: the adoption

of uniform cost accounting; the extension of the policy of selling on contract; the making of contracts with carriers for car service; the railroads to supply and operators to use the number required to fill sales contracts; the recognition of the rights of miners and encouragement of active cooperation from them in all matters in which they have an economic interest and in all ways through which they could help to increase output, improve quality, and reduce costs; improvement in those living conditions for which operators are directly or indirectly responsible; increased attention to the prevention of injuries; increased use of labor-saving machinery, and at the same time increased respect for the human workers, skilled and unskilled.

REVISION OF TAX METHODS

One of the worst of all taxes in the coal industry, from the point of view of operators, is that which is levied indiscriminately by the state of Pennsylvania on all anthracite produced in the state, a percentage of the market price at the mine. This is added to the price of the coal and passed on to the ultimate consumer, mainly the householders, the majority of them in other states. The Coal Commission recommended a federal differential tax on anthracite: one which would fall lightly or not at all on the coal produced at high cost, under difficult conditions, such as thin or steeply pitching viens; increasingly on the coal which, although sold at the same price costs less and less to produce; and in the maximum degree on that which costs the least to mine. Such a tax remains where it is put, on the operator or owner who can best bear it, who has

advantages for which he has paid nothing, unless as a recent buyer he has merely capitalized this very differential advantage. The same principle should be applied in the bituminous coal industry. Both federal and state taxes should be shifted as far as is practicable from production to ownership, from operators in general to operators who have natural advantages for which no original investment of capital or labor was necessary.

Thus free competition may become more beneficent. Society should never penalize enterprise, good management, efficiency in organization, reduction of costs through good labor relations or sales policies. To secure for the whole community the principal part of a natural resource, a favorable location, or socially created value, does not have this, but the contrary effect. Revision of revenue law, both state and national, so as to transfer taxes from enterprise to natural monopoly, would be of enormous benefit to the coal industry and to the public.

LABOR SOLUTION

It is a hard thing to say, but the best thing for some two hundred thousand mine workers to do is to get out of the mines and into other occupations. A certain amount of transition on the part of miners is constantly going on, from idle and irregular mines to new and more active ones, and also to factories, and farms, but others constantly come in to take their places. Men, in spite of the inadequate and irregular opportunities to work, stay as long as they can, hoping for better times, reluctant to risk a change to a strange locality, the cost of moving, and the losses of

many kinds which it usually entails. Operators also expect to have at least temporary seasons of full work, and naturally prefer to keep enough miners about, if they can, to be ready to take care of peak demands. Decrease in the total number of miners, which means a transfer of the surplus labor to other occupations, is likely to come only with stabilization. Miners alone cannot bring this about but they can help. Meanwhile they can help the general situation by doing the best thing for themselves and their sons, not lingering too long where they are not needed, not putting needless obstacles in the way of regularizing operations, and seeking other localities or even other occupations. They should also keep informed about places to which they might go, in other words, striking the best possible balance between free mobility and settled life, enjoying the latter when it is possible, but, in order not to pay too much for that advantage, keeping always ready to move, to change work, and to let their sons go into other vocations.

IMPROVEMENTS IN SANITARY AND LIVING CONDITIONS

Miners can help by belonging, and feeling that they belong, in the industry; by embracing every sound policy of cooperation, by thinking of the community where they are working as one in which they are to make their homes; by sharing in its civic and social life in its emotional and recreational life. Certainly this relation to the industry and to the neighborhood will have to be on terms consistent with self respect, with

fundamental economic interest. Miners can do much to secure these things for themselves. They have a right to insist and should use every means in their power to bring others to see, that a living wage is the first claim on the product of industry. What miners can do, is to raise their own standard of living, to practice the simple virtues and to reach out as they do on occasion for the heroic virtues also, to discover the satisfaction that comes from doing a fair day's work for a fair wage, to make the most of the existing good-will and to increase it. Miners and their families can do more than employers, even in company towns, to make their homes and neighborhoods comfortable, safe, sanitary, and beautiful. They must, of course, begin where they are, and for ugliness, discomfort, and dreariness it would be hard to beat the mining camps and most of the company towns.

They may work together and with the companies to get the best possible schools for their children, and if possible for adults also, and to see that there is no truancy, no failure to use what is available and useful. They may do their part to see that their houses are painted and kept in repair, that lawns and gardens are in order, dairies especially the one-cow dairy sanitary, food protected from flies and other sources of infection, and water from pollution, roads and paths clean and passable, life and property safe, and public opinion as alert and as well informed as possible.

MINIMIZING ACCIDENTS

Safety in the mine depends most of all on the miner.

The best of state and federal laws, the most frequent and conscientious inspections by federal and state officials, the most generous precautions of operators, the most elaborate rules and the most strigent warnings, will not make a mine safe for careless and incompetent workers. No amount of emphasis on what the miner can do can rightly be used to excuse either parsimony or negligence of the management. Yet the fact remains, that miners do endanger their own lives and the lives of their helpers and fellow workers by carelessness, ignorance, and disobedience of rules; by running undue risks, by failing to do their part in joint safety committees.

COOPERATION

What is needed, however, is something which neither the miners' union nor the employers' union has thus far achieved. That is nothing less than actual participation by miners in the management of all the mining operations. The official management, superintendent, foremen, and salesmen should in some degree represent the workers as well as the owners. For the workers to become holders of preferred shares, or otherwise to gather crumbs that fall from the table, is not enough. As workers they should have a voice in control.

THE NEED FOR FORECAST

America is more favorably situated with respect to coal than any other part of the world. A merely decent regard for future generations in America and elsewhere, reinforced by the influence of rising prices and occasional shortage in supply, should make us careful to mine with a

minimum of waste and to burn with a maximum of efficiency. Self-interest is likely in the future, as in the past to lead miners to restrict their daily output and operators to hold back production whenever it is necessary in order to maintain prices. In view of this, it seems reasonable to consider our coal reserves practically inexhaustible,

FEDERAL SUPERVISION

It is the Interstate Commerce Commission through which further regulation could be most easily and most naturally initiated. Most of the remedies which could be applied by the federal government, especially control of freight rates and of car service, are already within the jurisdiction of the Interstate Commerce Commission. To create in that Commission a special division charged with the collection of information, with the supervision of consolidations and contracts, with the integration of the bituminous coal industry as far as this can be brought about by federal supervision, would be the least departure from precedent and at the same time the most likely to succeed. A new body established for this purpose would have to go to the Interstate Commerce Commission when any question of effective action arose. It would, therefore, be more sensible to create the body with that Commission. The present Commission might be equal to the adoption of policies and approval of plans, if relieved of its administrative duties.

LACK OF UNIFORM ACCOUNTING METHODS

Realizing the different ways in figuring costs by the anthracite and bituminous coal operators, one is perplexed to know just what method is correct; what companies are calculating their expensies on an equitable basis; and what figures are inflated by erroneous charges to operation of capital items as locomotives, machinery, etc. There is no way of ascertaining by merely looking at the accounts or by accepting reports submitted by the operators themselves, whether or not such improper charges have been made to current operations. No doubt, the Coal Commission did not go so far as to audit the accounts of the operators, who furnished this Commission with information, because of the amount of work and expense it would entail. However, if the accounts were audited, the Coal Commission certainly would have found a number of the gross errors which have been mentioned. Therefore, in order to answer such questions which might arise as to what is the correct accounting procedure, we shall endeavor in this section, to discuss the various items making up the total cost and try and place the coal industry on an uniform method of arriving at the correct procedure of figuring the cost of coal.

PECULIARITIES

No doubt, every mine has its own peculiarities, and consequently only a general discussion of the various items can be made. Some mines are operated directly by the owners themselves, while others operate leased properties,

thus having to pay royalties on the total output; some are heavily mortgaged because of insufficient capital furnished by the operators, while others are not burdened with the necessity of meeting heavy interest charges. Consequently, it is natural that only such a general discussion can be made. Disregarding the various forms necessary in a coal accounting system, we shall (17) (18) start to discuss the system from its application to the contract labor working in the mine to its ultimate workings in the main office.

ACCOUNTING FOR LABOR COST

The responsibility of keeping the costs correct, originates with the following three persons: the weighmaster, the mine foreman, and the mine clerk. Each day after commencing operations, as the cars come up from the mine, the weighmaster must verify and record the weights of coal cut by miners. This record may be of any size but it is essential that it contain information as the section of the mine, the day, the miner's name or better still the miner's number, and the tons of coal mined. This information is then checked in some manner, usually by the foreman or the mine clerk, in order to obviate any disputes that might arise from the miners and also to eliminate any possible errors. The foreman should approve the weighmaster's record when passed into the mine clerk's hands, for the total cars of coal cut and also for the names or numbers of all contract miners. Every night or early next morning, the mine clerk records this information on a sheet known as "The Tipple Sheet"

and makes proper entries on his weekly summary sheet from which the weekly pay roll is based. Each day the mine clerk reports to the main office the mine's results for the preceding day. Any advances to miners are reported by the foreman to the main office and to the mine clerk where proper entries are made on the pay roll records. At the end of the week the mine clerk completes his summary of the coal produced, makes memorandum of the disposition of the coal, and makes up his pay roll sheets--giving the name and number of the employee, the daily tons of coal cut, the rate per ton, and amount. All records submitted by the mine clerk should have the approval of the foreman. In order that the foreman might be able to do this, it is necessary that he should keep a small book in which he can keep the names of the men employed under him on various jobs, This record then becomes the basis from which the mine clerk checks his pay roll sheets each week, both for contract men and day laborers. In order to eliminate any means by which the foreman might substitute dummies or fictitious persons on the pay roll, time clocks should be kept and supervised by the mine clerk. In addition to this it seems necessary that the main office should check against the employment cards, the names and rates and verify extensions on every pay roll. At the main office the production of coal as shown by the "Daily Tipple Reports" should be checked to the pay rolls and the time cards or the foreman's book used in checking the hours worked by day men. To

round out the check on labor a good system of paying off should be installed; either have the employees come to the office for their pay envelopes or have some responsible person meet the men as they come out from the mine. For men working above the ground, a similar check should be installed.

ACCOUNTING FOR COAL

In the bituminous coal industry the summary of the coal mined, ~~as~~ shown by the weekly summary submitted by the mine clerk, forms a basis from which a record of coal ready for shipment or coal ready for storage is made. This record should be kept at the main office. As coal is dumped into cars for shipment or stored until needed, proper records should be kept by a clerk under the supervision of the outside foreman or by the superintendent himself. This record shows the day, the division, the weighmaster's name, and the tons of coal received from underground. All bins used for storage should have known tonnage capacities. All sales of coal are made to employees ~~under~~ the authorization of the outside foreman and backed by the approval or order slips from the main office, and all contract shipments of coal should be supported by orders from the main office. Daily reports of coal received from the mines and coal shipped or sold to employees are made and signed by the outside foreman. This record gives the main office a check upon the coal mined and also upon all shipments.

In the anthracite industry, a little more complex problem arises. As the coal comes out from the mines, it

must go through the breakers to be sorted into the various sizes and then stored into bins having known tonnage capacities. The coal weights as shown by the weighmaster's records should be checked as the cars are emptied of their contents. Each day the clerk reports the total tons mined and the tons of the differenet sizes. This latter information can be obtained by using bins in the process of sorting out the coal.

Periodically, an inventory should be taken of the coal in cars, waiting for shipping instructions, and coal in storage, inorder to check up with the perpetual records thus far kept at the main office. However, just as in the cotton industry, an invisible loss in tonnage will be found. Record should be made of this invisible loss and any increase in the rate or per cent of loss should be carefully looked into.

ACCOUNTING FOR SUPPLIES

In order to account for supplies, tools, gun powder, etc. properly, a storehouse should be kept at the mine and under the supervision of a man, who should be responsible for his work to the superintendent of the mines or the foreman. All records of receipts of materials and supplies should be checked against the invoices and approved for payment or otherwise. The supplies are then recorded on proper records kept for this purpose at the main office, giving such essential information as the kind of material, the maximum and minimum quantities, the seller's name, date received, quantity, price, amount, and when the actual

physical quantities were checked against the book records. Requisitions for the issuance of materials should be authorized by the foreman and made out in triplicate, one going to the storehouse, one to the main office, and the foreman keeping the other. Each day the store man makes up a summary of materials received and issued and forwards it to the main office where it is checked against the invoices received and the requisitions from the foremen. Naturally, proper room and bins for storage should be made in the storehouse and kept under lock and key. All cash sales should be made through the main office.

Thus the main office has a direct control over the labor cost, the coal mined, and the materials used at the mine. Inorder to keep the perpetual records right, periodical tests should be made of the supplies and materials and any discrepancies should be carefully looked into and noted on the inventory card. A proper method of pricing the materials issued should also be maintained: the "moving average method" and the "first in and first out" being the most common methods.

BREAKING UP COSTS

After the payroll has been paid off and the weekly summary sent in by the store clerk, the main office should divide this information into corresponding groups. In other words, the cost of labor should be divided as to Mining, Ventilation, Drainage, Yardage and Dead Work, Stripping, Haulage, Tipple Operating, Screening or Breakers, Washery, and to Mine Overhead. The cost of materials should be divided likewise, thus giving a divisional cost,

made up of labor and materials. In the bituminous coal industry, overhead expenses are not proportioned as they are in the anthracite coal industry, thus making the cost accounting system easier to handle in the first case. In the anthracite industry the divisional costs, consisting of indirect labor and materials, are proportioned to the varies size coals. Here, much difficulty and controversy arises, as to what is the best method of distributing overhead. Some accountants maintain that all costs that cannot be said to apply to a particular size coal, should be proportioned on the basis of labor costs; some maintain that tonnage should be used as a basis; while still others claim that selling price should be the basic figure. No doubt there are many other methods of distributing costs, just as there are different types of minds, and consequently such a method as will give the most true and desired results should be used. In this particular industry it seems that the selling price should be used in distributing overhead, because, although the same amount of overhead can be said to be expended on each ton of egg and steam size coals, it does not take into consideration the fact that during the course of operations only a small per cent of the small size coals are mined per day. Neither does it take into consideration the fact that the price of coal is not determined as in other industries, but by supply and demand. Consequently, doesn't it seem logical that the selling price of coal should be used as the basic figure?

OVERHEAD

A discussion of the items making up this overhead cost will now be discussed and it is here that many of the operators vary from sound and good accounting practice. Accounting for anthracite mines presents a few accounting problems not encountered in other industries. The anthracite operator not only secures all his raw materials from the earth, but engages in the preparation of the raw material for the market, and can thus be classed as a manufacturer as well as a miner. One of the problems confronting the accountant in this industry is the question of capital expenditures or items included in overhead expenses.

CAPITAL EXPENDITURES

The cost of mine buildings, structures, machinery, and equipment, less their scrap or residual value, when the mine is exhausted, should be regarded as deferred charges to profit and loss and to the cost of producing coal. These items are sometimes reflected in the profit and loss account as depreciation or amortization. The general practice is to consider all expenditures for buildings, structures, machinery, equipment and mine developments, less the revenue from coal mined during the time in which the developments are in process and before the mine has actually begun to operate, as charges to capital accounts. All normal expenditures of a similar nature subsequent to the beginning of operations, which are required to maintain the present output, should be charged to operating expenses. Those required to increase

the output should be charged to capital accounts, and any charge to capital accounts presupposes an expenditure incurred for which benefits will be received in the future. Charges for mine developments should be analyzed to avoid charging to capital accounts expenditures which are applicable only to coal now being mined, and expenditures on account of coal to be mined in the future charged to profit and loss or operating expenses.

DEPLETION

Depletion, as applied to mining, is a physical process of using up what is in the ground, consequently inorder to protect the original amount of capital invested, a depletion reserve account should be set up and periodically credited with the cost of coal mined or taken out of the ground. This cost is determined by dividing the total cost of the coal lands by the estimated tons of coal expected to realize. This rate multiplied by the tons mined will give the amount to be credited to the depletion reserve account. In case of leased property, the total cost of the lease should be written off over the life of the lease and based on the expected tons to be mined during such period. However, many operators do not adhere to this method but charge any amount to the reserve that they think they want. Then again, some operators do not adhere to the strict meaning of cost, but use instead as there basis, the appraised value of the property, thus burdening the costs unduly. Instead of charging the proportion of the appraised value of the mine to operations, this amount

should be charged to Surplus, which was credited in the first place when the asset account was written up to its appraised value.

DEPRECIATION

Mine buildings, structures, machinery, and equipment should be depreciated on the basis of wear and tear or their life. In case the life of the mine is shorter than that of the assets, depreciation may be charged off in two ways:

1. On the bais of the life of the mine, charging off a certain equal portion each month.

2. By charging off a certain equal amount per ton as the coal is produced based on the estimated number of tons to be mined.

The second method is commendable in that it equalizes the depreciation cost per ton regardless of the number of tons to be mined. The use of the first method will cause a fluctuation in the depreciation cost per ton as the production varies from month to month. If the second method is used care should be taken to see that the proper amount is charged off on the time basis at least at the close of the fiscal year.

The following is a quotation from a report submitted by the Cost Accounting Committee of the National Coal Association: (18)180

"Capital investment in a coal mine is not a permanent asset; it is only an outlay preliminary to the extraction of the coal; it is merely an advanced or deferred charge upon future income, which capital, if recovered, must be

recovered with the current expenses of operations out of the proceeds of coal sold.

"In coal mining the exact unit for the measurement of work done is the ton of coal mined. It is also the exact unit for measuring depletion of mineral, wear and tear from use of equipment, and exhaustion of development. Development is a mere easement, the value of which disappears when the coal is gone.

"A coal mine being, as emphasized made up of several elements, all depreciating as the coal is mined, such depreciation is composite, accruing at a rate concurrent with the rate of extraction. The necessary rate per ton being determined, the aggregate depreciation for any accounting period and should of course, as far as practical, be distributed among the various elements in proportion to their respective costs or value.

"The doctrine that measures depreciation of coal mine plant and equipment in terms of time, excepting of course, some leasehold propositions is fallacious, as tested by the further assertion that a completely equipped mine could be maintained indefinitely without depreciation or wear or tear if no coal were mined, by minor repairs.

"Therefore, we insist, as a general rule--excepting some leaseholds--that the correct measure of the depletion and depreciation experienced in mining coal is the ton of coal mined.

"After a coal mine has been developed and equipped to its planned output capacity, charges to its capital account should cease, and thereafter there will be few if

any permissible charges to that account."

The following depreciation table should be used in determining the amount of depreciation: (18)180

DEPRECIATION TABLE - COAL MINES

KINDS OF EQUIPMENT	- MINING LOCATION - -BASED ON PHYSICAL CONDITION-					
	1	2	3	4	5	6
Tiple	Life of property					
Head Frame	Life of property					
Power Plant	7	7	7	7	7	7
Pumps	5	10	7	5	7	7
Motors	10	10	10	10	10	10
Mine Cars	4	4	4	4	4	4
Mules & Harness	4	4	4	4	4	4
Cables & Haulage	2	2	2	2	2	2
Electric Equipment	7	10	7	5	10	7
Houses	Life of property					
Mining Machinery	7	8	7	5	8	8
Hand Tools	1	1	1	1	1	1
Timber	Life of property		6	6	6	10
Rails	5	10	8	5	10	10
Wire & Trolley	7	10	7	5	10	7
Locomotives	10	10	10	10	10	10
Bee Hive Ovens		10	10	10	10	10
By Product Ovens		12	15	15	15	15
Washeries	Life of property					

Number 1: Anthracite
" 2: Bituminous, West Va., Illinois.
" 3: Ky., Tenn., Ga., Ohio, Indiana.
" 4: Mo., Kansas, Iowa, Ark., Okla., Alabama.
" 5: Texas, North and South Dakota.
" 6: Wy., Montana, Colo., New Mexico, Utah, Wash.

INSIDE AND OUTSIDE EXPENSES

The operating expenses are divided into two general classes: inside expenses and outside expenses. Aside from the question of supervision, this general classification is useful on account of the difference in physical condition inside and outside the mine. Inside expenses cover the cost of labor, supplies, and expenses in the mining and transportation of coal underground and includes the cost of operating the ventilation machinery and equipment. Inside expenses may show material differences in the cost per ton from month to month. These differences may be due to the physical conditions of the mine such as faults or irregularities in the seams, more timbering necessary on account of the character of the top of the gangway or chamber, the length of haul to the main shaft, drainage and ventilation required, etc., and the changes in these conditions during various cost accounting periods. The outside expenses cover the cost of transportation and preparation of coal after it has been removed from the mine and generally remain quite uniform as to cost per ton.

STEAM SIZES AS BY-PRODUCTS

Anthracite is prepared for the market in various sizes which are divided into two general classes: domestic or large sizes and steam or small sizes. Both these general classes include several standard sizes. On account of the difference in the amount realized from sales between the large and small sizes, it is the intention of each operator to produce as great a percentage of large sizes as possible. The large sizes have a sales value greater than the average

cost of all sizes, while, on the other hand, small sizes are sold at a price under the average cost. Futhermore, the market for small sizes fluctuates frequently both in price and in demand. It would seem good accounting to consider the small sizes as by-products rather than regular products, as mentioned above, either method being just as good. If this method is adopted, it is suggested that the total amount realized from the sale of small sizes or an arbitrary amount somewhat near the market price of small sizes be credited to the cost of the large sizes. Even though the small sizes were treated as by-products it would be impossible to distinguish between the cost of various large sizes such as lump or chestnut. The cost of large sizes should be carried at the average cost per ton.

RESERVES FOR CONTINGENCIES

In view of the fact that anthracite mining is a business of hazardous nature and mining companies are liable to uninsurable losses such as fires, explosions, floods and cave-ins or squeezes, it is undoubtedly good business and good accounting to set aside a reserve to cover these losses. Experience shows that uninsurable accidents are frequent and it would seem to be poor accounting not to reflect these losses in the cost of coal just as insurance is considered a proper cost charge.

STRIPPING EXPENSES

Stripping operations are performed for the purpose of removing earth, rock, etc. from the surface so that the coal exposed may be mined and in order to prevent

an excess of refuse from entering the mine when the coal near the surface is mined underground. The expense of stripping the surface earth, rock, etc., termed "overburden" may accumulate for a long period preceding the removal of the particular coal to be obtained from the operation. The expenses then become a deferred expense similar to certain inside developments, such as rock tunnels, etc. A portion of these deferred expenses should be charged to the profit and loss or cost accounts as the coal is removed and the amount to be charged off based on the estimated tons to be obtained divided into the total deferred stripping expenses. Should stripping expenses be incurred concurrently with the removal of coal, these expense should not be charged to deferred stripping expenses but to the current operating accounts.

CULM BANKS

Culm banks are by no means common to every anthracite mine, but the quantity of coal secured from these banks by operators, who do own them entitles them to special accounting consideration. Culm banks, however, produce less than five per cent of the total anthracite tonnage and will doubtless soon become extinct. Culm banks are large refuse dumps containing small sizes of coal and were made by early operations before such sizes were marketable. These sizes are now marketable and they can be extracted from the refuse or culm with modern coal preparation apparatus. The cost of culm bank coal will be considerably lower than that of freshly mined coal. In fact, the difference in cost is such that it would be

misleading were average costs of both culm bank and freshly mined coal used. The cost of each kind of coal should be kept entirely seperate. Sometimes culm bank coal is prepared in a plant built for that purpose, called a washery, and the keeping of seperate costs in this case is a simple matter. But if culm is run through the breaker at the same time as freshly mined coal, the seperation of the costs of each kind of coal becomes a problem of apportionment. The apportionment may be made quite accurately on the basis of tests of the quantity of coal realized per ton of culm and the number of tons of culm run through the breaker. Culm banks should be valued in the same manner as underground coal and depleted as the coal is seperated from the refuse.

End.

PART V

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